

NIKITINA, Yu.P.; VOL'PIN, G.I.

Kuberlo horizon of Paleocene sediments in the Yergeni Hills,
Sal-Manych interfluvium, and lower Don. Nauch.dokl.vys.shkoly:geol.-
geog.nauki no.1:89-93 '59. (MIRA 12:6)

1. Novocherkasskiy politekhnicheskiy institut.
(Yergeni Hills--Paleontology)
(Don Valley--Paleontology)

5.3400

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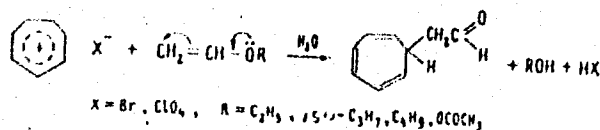
307/19-30-1-34/78

AUTHORS: Vol'pin, M. E., Akhrem, I. S., Kursanov, D. H.

TITLE: The Additions of Tropylium Salts to Vinyl Ethers

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 1, pp 159-163 (USSR)

ABSTRACT: Vinyl ethers vigorously react with tropylium salts.



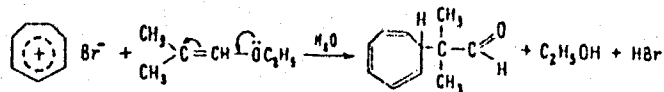
Tropylium salts react with vinyl ethyl-, vinyl iso-propyl-, and vinyl n-butyl ethers in aqueous or in aqueous-alcohol, and only one product, cycloheptatrienylacetaldehyde, is formed. Tropylium bromide reacts similarly with β,β -dimethylvinyl ethyl ether.

Card 1/5

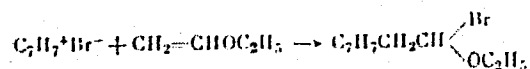
The Additions of Tropylium Salts to
Vinyl Ethers

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SOV/79-30-1-34/78



Tropylium bromide with vinyl ethyl ether in anhydrous nitromethane forms a brominated product which could not be isolated, and is probably an α -bromoether.



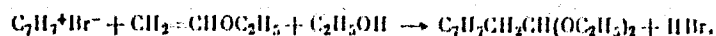
Acetal and acid are formed by the above reaction in anhydrous alcohol. The acid formed complicates the isolation of the acetal.

Card 2/5

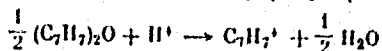
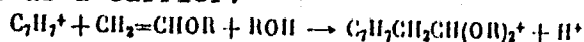
The Additions of Tropylium Salts to
Vinyl Ethers

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SOV/79-30-1-34/76



An attempt was made to prepare acetals by the reaction of vinyl ethers with ditropyl ether, but this reaction does not take place. The addition of tropylium salts (or an acid) (even in catalytic amounts) initiates a vigorous reaction. Ditropyl ether and vinyl ethyl ether in anhydrous alcohol form diethylacetal of cycloheptatrienylacetaldehyde, in good yield. The same reaction with vinyl butyl ether in anhydrous n-butyl alcohol yields di(n-butyl)acetal of cycloheptatrienylacetaldehyde. Probably an ionic chain reaction takes place in all cases, in which the tropylium cation serves as a carrier.



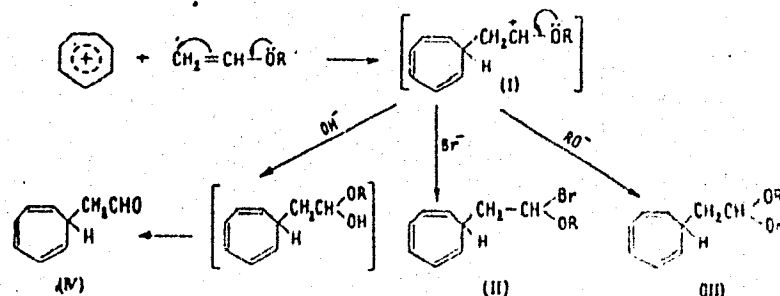
Card 3/5

The Additions of Tropylium Salts to
Vinyl Ethers

77373

SOV/79-30-1-34/78

It can be assumed that the formation of a carbonium ion of type (I) is an intermediate stage of reaction, and that the above ion in nonhydroxylic solvents is converted into bromoether (II); in alcohol, into acetal (III); and in water, into aldehyde (IV).



Cycloheptatrienylacetaldehyde was obtained in 58% yield, bp $62^\circ/2$ mm, n_D^{20} 1.5340, d_4^{20} 1.0204; cycloheptatrienyl-iso-butyric aldehyde, in 8.6% yield, bp $76-80^\circ/3$ mm,

Card 4/5

The Additions of Tropylium Salts to
Vinyl Ethers

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SOV/79-30-1-34/78

n_D^{20} 1.5201; diethyl acetal of cycloheptatrienylacetaldehyde, in 72% bp $102^\circ/5$ mm, n_D^{20} 1.4876; dibutyl acetal of cycloheptatrienylacetaldehyde, in 75%, bp $130^\circ/3$ mm, n_D^{20} 1.4806, d_4^{20} 0.8188; diiso-propyl acetal of cycloheptatrienylacetaldehyde, in 75.6%, bp $96-100^\circ/3$ mm, n_D^{20} 1.4856. There are 4 references, 3 Soviet, 1 U.S. The U.S. reference is: W. E. Doering, L. H. Knox, J. Am. Chem. Soc., 76, 3203 (1954); 79, 352 (1957).

SUBMITTED:

January 5, 1959

Card 5/5

L 15463-63

EWP(j)/EPF(c)/EWT(m)/BDS ASD PC-4/Pr-4 EM/WW/MAY

ACCESSION NR: AP3005440

S/0020/63/151/005/1100/1103 68
67AUTHORS: Vol'pin, M. Ye.; Dubovitskiy, V. A.; Nogina, O. V.; Kursan-
ov, D. N. (Corr. member AN SSSR)

TITLE: Combining titanocene (dicyclopentadienyl titanium) with tolane

SOURCE: AN SSSR. Doklady*, v. 151, no. 5, 1963, 1100-1103

TOPIC TAGS: dicyclopentadienyl titanium ditolane, titanocene,
dicyclopentadienyl titanium, tolane, diphenylacetylene, 1,2,3,4-
tetraphenylbutadiene, titanoceneditolane

ABSTRACT: Because of its carbenoid character, dicyclopentadienyl titanium was selected for reaction with diphenylacetylene (tolane) in a 1:2 ratio to form the stable titanoceneditolane. The latter cleaved upon brominating to form titanocene dibromide and the dibromide of a Ti-free hydrocarbon. Heating, or treatment with aqueous or non-aqueous KOH, gave 1,2,3,4-tetraphenylbutadiene. Orig. art. has: 10 formulas.

ASSOCIATION: Institute of organometallic compounds, Academy of sciences, SSSR

Card 1/1

VOL'PIN, M.Ye.; AKHREM, I.S.; TEREHT'YEVA, Ye.A.; KURSANOV, D.N.

Mechanism of tropylation reaction. Izv.AN SSSR.Otd.khim.nauk
no.5:802-808 My '63. (MIRA 16:8)

1. Institut elementoorganicheskikh sovedineniy AN SSSR.
(Tropylium compounds)

L 17097-63
WW/JD

EWP(j)/EPF(c)/EWP(q)/EWT(m)/BDS AFFTC Pc-4/Pr-4 RM/
S/062/63/000/004/015/022

AUTHOR: Leytes, L. A., Dulova, V. G., and Vol'pin, M. Ye.

TITLE: Three-membered heteroaromatic compounds. Report 5. Vibrational spectra and the structure of germanium heterocyclics

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 4, 1963, 731-737

TEXT: The vibrational spectra of the three-membered germanium heterocyclics were studied to establish the structure of these compounds. The IR-spectra of 1,1-disubstituted germirenes, 1,1-disubstituted 2,3-diphenylgermirenes and 1,1-dimethyl-2,3-diphenylsilirene were obtained in the range 400-3200 cm^{-1} on the UR-10 spectrograph. The graphs are presented in one figure and the frequency and field intensities in one table. The combination scattering spectrum was taken for only one compound on the ISP-51 apparatus. The UV-spectrum was taken for this compound also on the SP-41 double vacuum monochromatoscope. "The authors thank V.A. Petukhov for taking the UV-spectrum."

Card 1/2

L 17097-63

S/062/63/000/004/015/022

Three-membered heteroaromatic.....

2

There are 2 figures and 1 table.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR i
Institut organicheskoy khimii im. N. D. Zelinskogo Akademii
nauk SSSR (Institute of Organo-Elemental Compounds of the Academy
of Sciences USSR and the Institute of Organic Chemistry, Academy
of Sciences USSR)

SUBMITTED: June 9, 1962

Card 2/2

L 17065-63 EWP(j)/EPF(c)/EWP(q)/EWT(m)/ S/062/63/000/004/014/022
 BDS AFFTC/ASD Pc-4/Pr-4 RM/WW/JD
 AUTHOR: Vol'pin, M. Ye., Dulova, V.G., and Kursanov, D.H. 69
 68
 TITLE: Three-membered heteroaromatic compounds. Report 4. Interaction
 between germanium di-iodide and acetylene, and the synthesis of
 a three-membered heterocyclic compound and a germanium-containing
 polymer.
 PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, 27
 no. 4, 1963, 727-731
 TEXT: The purpose of the study was to continue the research on forma-
 tion of stable three-membered heterocyclic compound formed during the addition
 of germanium di-iodide on the triple carbon-carbon bond of diphenylacetylene 7
 and to obtain germanium heterocyclics with a simpler structure not containing
 the phenyl groups. GeI_2 is added to acetylene at 130-140°, the reaction pro-
 ceeding analogously to the addition to diphenylacetylene and resulting in the
 formation of the three-membered heterocyclic 1,1-diiodogermirene (2,2-diido-

Card 1/3

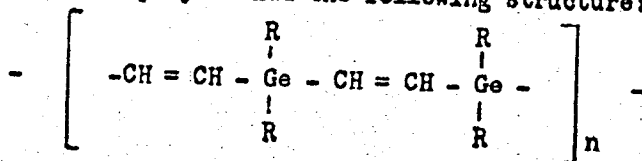
L 17065-63

S/062/63/000/004/014/022

Three-membered heteroaromatic

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2-germaniumcyclopropene). During the reaction of GeI_2 with acetylene, considerable quantities of polymeric products are obtained in addition to the three-membered cyclic. Infra-red and nuclear magnetic resonance spectra indicated the obtained polymer had the following structure:



where $\text{R} = \text{I}, \text{CH}_3, \text{ or } \text{C}_6\text{H}_5$. In structure these polymers are close to the so-called organic semiconductors and can represent great interest from the viewpoint of the character of the interaction of the pi-electrons in the polymer chain, since the interaction of pi-electrons of double bonds with d-orbits of germanium can contribute to partial delocalization of pi-electrons

Card 2/3

L 17065-63

S/062/63/000/004/014/022

Three-membered heteroaromatic

in the polymer chain. There are 2 figures. The most important English-language reference reads as follows: K. B. Wiberg, B. J. Mist, J. Amer. Chem. Soc., 83,1226 (1961).

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR
(Institute of Organo-Elemental Compounds, Academy of Sciences
USSR)

SUBMITTED: June 9, 1962

Card 3/3

VOL'PIN, M.

What did the audit show. Fin. SSSR 37 no.8:64-68 Ag '63.
(MIRA 16:9)
1. Glavnyy kontroler-revizor kontrol'no-revizionnogo upravleniya
Ministerstva finansov RSFSR.
(Ivanovo Province--Auditing and inspection)

VOL'PIN, M.

Prisoner of local tendencies. Fin. SSSR 22 no.9:66-71 5 '61.
(MIRA 14:9)

1. Glavnyy kontroler-revizor Kontrol'no-revizionnogo upravleniya
Ministerstva finansov RSFSR,
(Banks and banking)
(Construction industry--Auditing and inspection)

VOL'PIN, M.

How we organize comprehensive audits. Fin. SSSR 23 no.4:45-49
Ap '62. (MIRA 15:4)

1. Glavnyy kontroler-revizor Kontrol'no-revizionnogo upravleniya
Ministerstva finansov RSFSR.
(Auditing)

Reaction of olefins with ammonia. A. D. oxide catalysts with formation of methylamine. Plate a d M. E. Vol'pin (M. V. Lomonosov State Univ., Moscow). Doklady Akad. Nauk S.S.S.R. 89, 317-20 (1953); cf. C.A. 48, 3658c. The activity of a series of olefins (C_2H_4 , C_3H_6 , $Me_2C=CH_2$, and 2-methyl-2-butene) toward NH_3 over aluminum-oxide catalyst (15% Me_2O and 85% Al_2O_3) is investigated. The reaction was carried out at atm. pressure. Olefins with a 5-fold excess of NH_3 are passed over 35 cc. of catalyst at a rate of 0.07 mole of olefin/hr. Before each test the catalyst is reduced in a current of H_2 for 3 hrs. at 500° . After the test the coke which has deposited on the catalyst is removed by roasting in a current of dry air at 500° . Independent of the original olefins, the product was chiefly $MeCN$ (I) and very small quantities of substances of amine character; in the case of C_2H_4 and NH_3 , traces of $EtCN$ were found. NH_4CN , CO , and gaseous products (H_2 , N , satd. hydrocarbons, and coke) are also produced. The reaction begins at a temp. above 450° and the greatest yield is reached at a temp. of about 500° (at 484° the yields of I are for: C_2H_4 , 16.7%; C_3H_6 , 3.5%; $Me_2C=CH_2$, 29.9%; and $Me_2C=CHMe$, 41.6%). With the catalyst, the formation of I from C_2H_4 and NH_3 starts about 420° ; with increase to 485° the yield of I quickly increases, reaches a max. value, and at the temp. continues to increase the yield quickly decreases; at a temp. above 600° I is absent from the reaction products. The reason for the decrease in the yield of I at temps. above 500° seems to be the quick increase in the rate of competing side-reactions. In the reaction of C_2H_4 with NH_3 , increased temp. increases the quantity of NH_4CN ; the quantity of C_2H_4 in the waste gases reaches a max. at 700° and decreases at higher temps. also with decrease in yield.

OVER

of unreacted C_2H_2 . The predominant side-reaction here is the decompn. of NH_3 to N and H_2 . An essential side-reaction is the cracking of the original C_2H_2 and its hydrogenation to C_2H_4 ; C_2H_2 with an equivalent quantity of H_2 reacts almost completely; below 500° the hydrogenation predominates, but at higher temp. cracking produces noticeable quantities of CH_4 . It appears that the I, which is formed, is also decompd. by the catalyst; the decompn. begins at about 400° and the rate quickly increases with increased temp. The decompn. products consist of HCN, CH_4 , C_2H_4 , NH_3 , H_2 , CO, and considerable C. At 408° , 88 g-atoms of C are formed per 100 moles of decompd. I. In the presence of the catalyst, the decompn. temp. of I is further reduced to 300° . In like manner I is decompd. in its passage over the same catalyst in a stream of NH_3 . In this way, the unusual character of the relation of the yield of I to temp. in the reaction of C_2H_2 with NH_3 is shown by the narrow temp. interval (within several deg.) in which the yield of I is max., and the rapid decrease in yield which a further increase of temp. brings about through a rapid increase in rate of the side reactions (viz. decompn. of NH_3 to its elements, hydrogenation and cracking of C_2H_2 , decompn. with formation of I). The formation of waste gases by the reaction of C_2H_2 with NH_3 shows that in this case the decreased yield of I at temps. above 500° is correlated with the analogous side-reaction. Comparison of the quantities of C_2H_2 formed here with the quantity of C_2H_2 formed above shows that the rate of the side-reaction of hydrogenation of C_2H_2 is twice as great as the hydrogenation of C_2H_2 ; this is the reason for the smaller yield of I from C_2H_2 compared with that from C_2H_4 .

A.F. PLATE

2/2

Vol'pin, M.K.

Chemical Abst.
Vol. 48
Apr. 10, 1954
Organic Chemistry

The mechanism of formation of acetonitrile from olefins and ammonia. A. P. Pace and M. E. Vol'pin (M. E. Vol'pin, State Univ. Moscow, U.S.S.R. 89 491-4193). *Chem. Abstr.* 48:10000 (1954).
C₃H₆, apparently proceeds through formation of a complex followed by dehydrogenation to MeCN. Higher olefins also yield MeCN with chain rupture and loss of atoms. C₄H₈ yields C₂H₆ and C as by products. Presumably the intermediate here is iso-PrNH₂, which loses H₂ to give MeC₂NH₂ which then loses CH₄ to give MeCN. Above 400°, iso-PrNH₂ actually yields MeCN. Addition of secondary and tertiary amines (C₂H₅)₂NH and (C₂H₅)₃NH to the catalyst in NH₃ in a narrow temp. range around 400° gives 50% MeCN, which is the max. yield. At 400° iso-PrNH₂ yields products which give Me₂CO when boiled with H₂O, thus confirming the above scheme. The possibility of anti-Markovnikov addn. of NH₃ to the olefins, is discounted, as is the scheme given by Stevenson (C.A. 43, 7759b (4), 8553a). At 497° the same catalyst causes but partial degradation of EtCN, yielding an approx. 50-50 mixt. of EtCN and MeCN. PrNH₂ in an NH₃ stream at 490° gave some MeCN and EtCN, and C₂H₆ 4, CO 5.8, CH₄ 12, C₂H₄ 1, NH₃ 23.5%, MeCN 4.2%, as well as MeCN 64 and EtCN 23.5%.

M. E. Vol'pin

VOL'PIN, M. Ye. and PLATE, A. F.

"Preparation of Acetonitrile by the Reaction Between Olefines and Ammonia
in the Presence of Oxide Catalysts".

Izv. An Az SSR, No. 2, pp 55-65, 1954.

Acetonitrile can be prepared by the reaction of NH_3 with certain olefins in the presence of aluminum-molybdenum oxide catalysts. The activity of this catalyst can be increased by preliminary reduction of the Mo catalyst. The catalyst is further reduced during the course of the reaction, with the maximum yield of acetonitrile being achieved after 3 hours of work. Small additions of oxygen or air selectively poison the catalyst and retard coking, thus increasing the yield of acetonitrile by 1.5 times. Pure Al_2O_3 has no catalytic activity in the olefin-ammonia reaction. (RZhKhim, No 4, 1955)

SO: Sum No 884, 9 Apr 1956

VOL'PIN, ME.

✓ Transformations of cycloolefins in the presence of ammonia over aluminomolybdenum oxide catalyst. A. P. Plate, M. E. Vol'pin, and S. V. Zotova. *Vestnik Moskov. Univ.* 10, No. 2, Ser. Fiz.-Mat. i Estestv. Nauk No. 1, 77-80(1958).—Passage of cyclopentene in NH_3 atm. over Mo-Al oxide catalyst at 484-545° failed to yield any nitriles, but gave coke, cyclopentane, and cyclopentadiene, with traces of cyclopentylamine. Cyclohexene under similar treatment at 472° gave C_6H_6 and cyclohexane, and 0.9% PhNH_2 . C_6H_6 under these conditions gave 0.27% PhNH_2 .
G. M. Kuzolapoff

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USSR/Chemistry ^{Vol'pin, M. Ye.} Organic

FD-1634

Card 1/1 : Pub. 129-9/25

Author : Plate, A. F.; Vol'pin, M. Ye.; Zotova, S. V.

Title : Transformation of cycloolefins in the presence of ammonia over aluminum and molybdenum oxide catalyst

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, Vol 10, 77-80, Feb 1955

Abstract : Cyclic olefins (cyclopentene and cyclohexene) behave in a manner different from that of the straight chain olefins when treated with ammonia in the presence of molybdenum oxide on aluminum oxide catalyst. There is no detectable formation of acetonitrile or of any higher nitriles. Hydrogen disproportionation and dehydrogenation predominate. Under the experimental conditions, cyclohexene and benzene react with ammonia to form a small amount of aniline. Equation, two tables; nine references (eight USSR)

Institution : Chair of Petroleum Chemistry

Submitted : June 23, 1954

"APPROVED FOR RELEASE: 08/09/2001

CIA-RDP86-00513R001860720014-2

|| VOL 100, M 1E

APPROVED FOR RELEASE: 08/09/2001

CIA-RDP86-00513R001860720014-2"

Vol. 1, No. 11, 1956

4

Catalytic transformation of amines over aluminumoxy-
denum catalyst. A. F. Platé, M. E. Vol'pin, E. A. Re-
formatskaya, and S. V. Zotova -- *J. Gen. Chem. U.S.S.R.*
26, 785-90 (1956) (English translation) -- See *U.S. A. 50.*
14710f *Chem.*
B. M. R.

Effect of nucleophilicity of an anion on the character of the
bond in organic compounds M. E. ...

4

4810-9

Vol. 100, 112, 95

to orange hydroxypropyl-urea

Vol'pin, M. Ye.

AUTHORS: Kursanov, D.N., Vol'pin, M. Ye., 62-11-12/29
Akhrem, I. S., Kachkurova, I. Ia.

TITLE: Curtius' (Kurtsius) Rearrangement in the Series of Isomeric
Cycloheptatrienecarbonic and Norcaradienecarbonic Acids
(Peregruppirovka Kurtsiusa v ryadu izomernykh
tsiklogeptatriyenkarbonovykh i norkaradiyenkarbonovoy
kislots).

PERIODICAL: Izvestiya AN SSSR, Otdelenie Khimicheskikh Nauk, 1957,
Nr 11, pp. 1371-1378 (USSR)

ABSTRACT: Here Curtius' rearrangement in the series of isomeric α -
cycloheptatrienecarbonic-(I), (R = COOH), β -cyclohepta-
trienecarbonic-(II) (R = COOH), γ -cycloheptatrienecarbonic
-(III) (R = COOH) acids are systematically investigated.
It is shown that the rearrangement takes place under the
conditions here existing without an isomerization of the
migrating hydrocarbon radical.
For the first time here 1,3,5-, 1,3,6- and 2,4,6- cyclo-
heptatrienylisocyanate, norcaradienylisocyanate, 1,3,5,-
1,3,6, and 2,4,6-cycloheptatrienylurea, norcaradienylurea,
N-phenyl-N'-1,3,5-, 1,3,6- and 2,4,6-cycloheptatrienylurea

Card 1/2

AUTHORS: Vol'pin, K.Ye., Akhrem, I.S., Kurzanov, D.H. 62-12-20/20

TITLE: Letters to the Editor (Pis'ma redaktoru)
New Reactions of Tropyli Salts (Novyye reaktsii soley tropiliya).

PERIODICAL: Izvestiya AN SSSR Otdeleniye Khimicheskikh Nauk, 1957, Nr 12,
pp. 1501-1502 (USSR)

ABSTRACT: It was shown that the salts of cycloheptatrienyl very easily alkylate the compounds with mobile hydrogen. Tropyli salts react with the same ease with various aliphatic aldehydes. Aliphatic and aromatic ketones when heated also enter into reaction with the salts of tropyli. The latter easily alkylates numerous aromatic compounds. Tropyli differs from the other simple esters by the fact that it alkylates the esters of β -keto acids, β -diketones, and β -dicarboxylic acids easily in the case of soft conditions. Thus, cycloheptatrienylacetone acid ester is formed with aceto acid ester. The tropyli salts easily attach themselves to the compounds with activated short bonds (like vinyl esters, cyclopentadiene, phenyl acetylene, and others). The reactions investigated offer new possibilities for the synthesis of the derivatives of cycloheptatriene and tropyli. There are 4 references, 3 of which are Slavic.

Card 1/2

Letters to the Editor. New Reactions of Tropyli Salts

62-12-20/20

ASSOCIATION: Institute for Elemental-organic Compounds AS USSR (Institut
elementoorganicheskikh soyedineniy Akademii nauk SSSR).

SUBMITTED: October 9, 1957

AVAILABLE: Library of Congress

Card 2/2 1. Tropyli salts-Reactions

USCOMM-DC-54782

VOL'PIN, M.Ye.; ZHDANOV, S.I.; KURSANOV, D.N.

New tropilium salts. Tropilium ion polarography. Dokl. AN SSSR 112
no.2:264-266 Ja '57. (MIRA 10:4)

1. Chlen-korrespondent AN SSSR (for Kursanov). 2. Institut elemento-
organicheskikh soyedineniy i Institut fizicheskoy khimii Akademii
nauk SSSR.
(Cycloheptatrienyl)

VOLPIN, M.Ye.

AUTHOR KURSANOV D.N., Corresponding Member of the Academy ~~XXXXXXXXXX~~
VOLPIN M.Ye. 20-2-27/67

TITLE ~~A New Method For Production of Tropilium And Metatropilium~~
Compounds.
(Novyy put'polucheniya soyedineney tropiliya i metatropiliya
-Russian)

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 2, pp 339-342 (U.S.S.R.)
Received 6/1957 Reviewed 7/1957

ABSTRACT At present two fundamentally different ways of producing the 7-
term aromatic tropilium-system are known: 1.method: tropilium-
dibromide (including small quantities of salts of the carbonyl-
tropilium) is obtained by separating HBr dibromal cycloheptadie-
ne. 2.method: This method is based on the slight isomerization of
a noradiene-system into a tropilium-system. However, it would
doubtlessly be interesting to investigate the possibility of a di-
rect transition from the cycloheptatriene-system (IV) (tropilide-
ne) with 3 double bonds to the aromatic tropilium-system. A con-
jugation of all of the six double bond- π -electrons must be possib-
le which is realized in consequence of the separation in any way of
a hydrogen atom together with an electron pair from the CH_2 -group
of the cycloheptatriene and then at the same time the transition of
the 7th carbon atom from the sp^3 -hybridization condition into the
 sp^2 - hybridization condition must be possible, which would lead to
the formation of the aromatic tropilium-system. Here a nonbenzoid

Card 1/3

A New Method For Production of Tropilium And
Metatropilium Compounds.

~~SECRET~~

20-2-27/67

aromatic system α -electrons would develop. When studying this direct transformation from cyclopentadienes into tropilium salts the authors investigated the influence of a number of electrophilic reagents, strong acids, oxidation agents, haloid derivatives etc. on tropilium salts. On the occasion of an influence of concentrated sulphuric acid on cycloheptatrienes an exothermic reaction accompanied by formation of resin develops. However, a tropilidene oxydation together with formation of considerable quantities of tropilium salts (18%) takes place. Acids without any oxidizing properties (concentrated phosphoric acid, hydrochloric acid) do not lead to a formation of tropilium. Concentrated nitric acid reacts very turbulently with cycloheptatriene, and small quantities of tropilium develop. Other oxidation agents in acid media effect a slighter or stronger transformation of cycloheptatriene into tropilium (CrO_3 - 14%, SeO_2 - 7% yield of tropilium salt). Phosphorus pentachloride very slightly reacts with cycloheptatriene at normal room temperature. Tropilium chloride develops and PCl_5 is reduced to PCl_3 . This reaction can serve as a good preparation method for producing tropilium salts. It is better to prepare tropilium as a more continuous, not very hygroscopic, not easily soluble perchlorate, chloroplatinate or iodide. The same

Card 2/3

A New Method For Production of Tropilium And Metatropilium Compounds.

20-2-27/67

method is applicable for the preparation of methyltropilium salts ($\text{II}, \text{R}=\text{CH}_3$) by the influence of phosphorus pentachloride on methylcycloheptatriene. On the other hand neither phosphorus trichloride nor phosphorus tribromide is able to effect this transformation. Similar to the reaction with phosphorus pentachloride the other proceeds with suluryl chloride. 25% tropilium salt develop with considerable resinification. Thionyl chloride does not react with cycloheptatriene. In the experimental part experimental conditions are described in detail.
(With 6 citations from publications).

ASSOCIATION
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Card 3/3

Institute for element-organic Compounds of the Academy of Science
of the U.S.S.R.
16.10.1956
Library of Congress

KURSANOV, D.N.; VOL'PIN, M.Ye., kand. khim. nauk; PARNES, Z.N., kand. khim. nauk.

New aromatic systems. Report No.1: Tropylium cation and cyclopentadienyl anion as nonbenzene aromatic systems. Khim. nauka 1 prom. 3 no.2:159-173 '58. (MIRA 11:6)

1. Olen-korrespondent AN SSSR (for Kursanov).
(Organic compounds)
(Cycloheptatrienylium compounds)
(Cyclopentadienyl)

Vol'pin, M / F

79-2-10/51

AUTHORS: Vol'pin, M. Ye., Akhrem, I. S., Kursanov, D. K.

TITLE: The Influence Exerted by the Nucleophilia of the Anion Upon the Nature of Linkage in Tropilium Compounds (Vliyaniye nukleofil'nosti aniona na kharakter svyazi v soyedineniyakh tropiliya)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 2, pp. 330 - 333 (USSR)

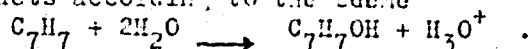
ABSTRACT: A number of salts of the aromatic 7-member cation of cycloheptatrienyl (tropilium) was recently produced (references 1 to 3). They are all salts of sufficiently strong acids ($X = Cl, Br, J, ClO_4, PtCl_6, B(C_6H_5)_4, HCO$). On the other hand the tropiliumoxide, methoxytropilium, tropilium cyanide, tropiliumthioether (references 1 and 2), where the X^- is an anion of sufficiently weak acids, are covalent compounds of type (II). Here and further the authors leave open the question whether the covalent tropilium derivatives possess a cycloheptatriene- or norcadiene structure (cf. reference 4). The authors made it their task to determine the boundary where the ionic compound $C_7H_7^+X^-$ transforms into the covalent compound C_7H_7-X . For this purpose they synthesized tropilium derivatives of acetic and benzoic acids ($K_a = 1.75 \cdot 10^{-5}$ and $6.3 \cdot 10^{-5}$). As well the tropilium acetate as the tropilium benzoate (more exactly the cycloheptatrienylacetate and -benzoate) proved to be typically covalent

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79-2-10/11

The Influence Exerted by the Nucleophilicity of the Anion Upon the Nature of Linkage in Tropilium Compounds

compounds - liquids - which can be solved in nonpolar solvents. Thus the transition from the ionic salts of tropilium to the covalent derivatives lies in the interval K_a of the corresponding acids. These results agree with the data by Darin, (reference 1) that the tropilium ion behaves in water like the acid $K_a = 1.8 \cdot 10^{-5}$ and reacts according to the scheme



The results obtained point to the assumption that the acids with $K_a > 1.2 \cdot 10^{-4}$ will yield ionic salts with tropilium: the acids $K_a \leq 6.8 - 1.75 \cdot 10^{-5}$ must yield covalent compounds with tropilium. This result is confirmed by the results of the interaction of tropilium bromide or tropilium perchlorate and cyclopentadienyl lithium. The formation of the covalent compound is explained by the weak acid properties of cyclopentadiene and consequently by the considerable nucleophilicity of the anion $C_5H_5^-$. The tropilium acetate and -benzoate were synthesized by means of acylation of tropilium oxide (dicycloheptatrienylether) with corresponding acetic and benzoic anhydrides. This method of ether production may have quite a general importance. The attempts to produce tropilium acetate by means of an exchange reaction of tropilium perchlorate and potassium

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70-2-10/51

The Influence Exerted by the Nucleophilicity of the Anion Upon the Nature of Linkage in Tropilium Compounds

acetate in water and in alcohol were unsuccessful. Neither was it possible to produce tropilium benzoate by the exchange of potassium benzoate and tropilium perchlorate in water, nor by an exchange reaction of silver benzoate and tropilium bromine in alcohol or nitromethane. This indicates the instability of the cycloheptatrienyl ether and the inclination to hydrolysis. The covalent compound C_7H_7-X in tropilium cyanide and tropiliumcyclopentadienyl proved to be considerably stabler. It is interesting that in the acid process of the hydrolysis of tropilium cyanide a partial isomerization supposedly takes place and that phenylacetic acid is formed. Conclusions: 1) Tropilium acetate, -benzoate and cyclopentadienylcycloheptatriene which proved to be covalent compounds were produced. 2) It was shown that the nature of linkage of the cycloheptatrienyl residue with the anion depends on the nucleophilicity of the anion. The transition from ionic to covalent tropilium derivatives lies in the range of K_a from $1.2 \cdot 10^{-4}$ to $6.3 - 1.75 \cdot 10^{-5}$. 3) It was shown that in the case of an acid hydrolysis of tropilium cyanide a regrouping with the formation of phenylacetic acid takes place. There are 6 references, 2 of which are Slavic.

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79-2-10/64

The Influence Exerted by the Nucleophilicity of the Anion Upon the Nature of Linkage
in Tropilium Compounds

ASSOCIATION: Institute for Elemental-organic Compounds AS USSR
(Institut elementoorganicheskikh soedineniy Akademii nauk SSSR)

SUBMITTED: April 15, 1957

AVAILABLE: Library of Congress

Card 4/4

SOV/ 20-120-3-26/67

AUTHORS: Kursanov, D. N., Corresponding Member, Academy of Sciences, USSR, Vol'pin, M. Ye., Akhrem, I. S.

TITLE: The Reaction of Tropylium Salts With Vinyl Ethers and Mercury β -Chloroacetaldehyde (Reaktsiya soley tropiliya s vinilovymi efirami i β -khlormerkuratsetal'degidom)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 3, pp. 531-534 (USSR)

ABSTRACT: A characteristic property of the stable aromatic cation of cycloheptatrienylium (tropylium) is represented by its capability to react with nucleophilic reagents. (Ref 1). It was to be expected that the electrophilic property of the tropylium cation is sufficient also for a reaction with more weakly nucleophilic reagents, as vinyl ethers. This actually was the case, as the tropylium salts react with simple vinyl ethers in aqueous or alcohol solutions even in the cold under a self-heating. This high reactivity is a result of the influence of the electron-donor ether group. Compounds with isolated or conjugated double bindings, however, without

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SOV 2-120-3-26/67

The Reaction of Tropylium Salts With Vinyl Ethers and Mercury β -Chloro-acetaldehyde

activating substances (as, for example, methylcyclohexene, cycloheptatriene and others), or with electron accepting substituents (cinnamic acid, acrylic acid, acrylonitrile, chloroallyl and others) do not react with tropylium salts under identical conditions. In all cases the same product results independent of the nature of the anion of the initial salt of tropylium (whether bromide or perchlorate) and independent of the character of the alkyl in the vinylalkyl ethers: cycloheptatrienyl acetaldehyde. This reaction is analogous to that of the addition of mercury salts to vinyl ethers (Ref 2). Therefore it could be assumed that the mechanism of interaction of the tropylium salts with vinyl ethers includes an attack upon the double binding of the vinyl ether by the ion $C_7H_7^+$. At the same time, or subsequently, an action of one molecule of the solvent (water or alcohol) takes place. An acetal or a semi-acetal is probably the intermediate product of the reaction. The reaction velocity with the tropylium salts is markedly reduced at the transition from the simple vinyl ether to the vinyl acetate. This apparently is connected with a partial withdrawal of electrons by the C=O group.

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SOY20-120-3-26/67

The Reaction of Tropylium Salts With Vinyl Ethers and Mercury β -Chloro-acetaldehyde

Cycloheptatriene acetaldehyde was also obtained by a counter synthesis, that is to say by a reaction of the tropylium salts (bromide or perchlorate) with mercury β -chloroacetaldehyde. Because of an exchange of an Hg-atom with a tropylium radical an aldehyde was produced, which was identical with that produced from vinyl ethers. This is the first case to be investigated of an interaction of organomercury compounds with tropylium salts. The reaction of the tropylium salts with mercury β -chloroacetaldehyde proceeds according to the type of C-alkylation. The haloid acyls O-acylate mercury β -chloroacetaldehyde. There are 4 references, 3 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk
SSSR
(Institute of Elemental-organic Compounds AS USSR)

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SOV/20-120-3-26/67

The Reaction of Tropylium Salts With Vinyl Ethers and Mercury β -Chloro-
acetaldehyde

SUBMITTED: January 14, 1958

1. Tropylium salts--Chemical reactions
2. Vinyl ethers--Chemical reactions
3. Mercury compounds (organic)--Chemical reactions

Card 4/4

VOL'PIN, M. Ye. Doo Chem Sci -- (diss) "Study of nonbenzoid aromatic systems of
troyyl and cyclopropenyl." Mos, 1959. 20 pp (Acad Sci USSR. Inst of
Elementoorganic Compounds), 150 copies (KL, 52-59, 116)

Volpin, M. Ye.

Volpin, M. Ye.; Stetskov, Ya. T.; Krut'yanova, Tat'yana I'ovna;
Volpin, M. Ye.; Mensarov, D. N.

"The Crystal Structures of Treglylic Perchlorate and Lactide"

a report presented at Symposium of the International Union of
Crystallography Leningrad, 21-27 May 1959

5(4)

AUTHORS:

Vol'pin, M. Ye., Koreshev, Yu. D.,
Kursanov, D. N.

SOV/62-59-3-34/37

TITLE:

Diphenyl Cyclopropanone - Three-membered Analogue of Tropone
(Difeniltsiklopropanon - trekhchlennyy analog tropona)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,
1959, Nr 3, p 560 (USSR)

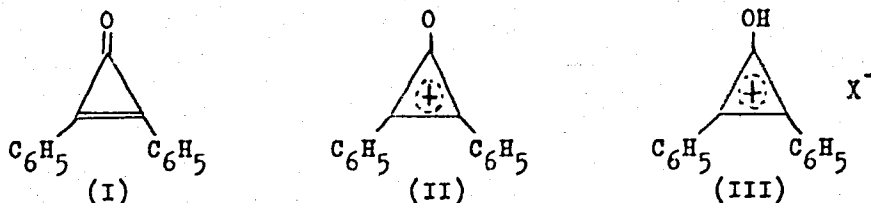
ABSTRACT:

In this letter to the editor the authors write: We obtained diphenyl cyclopropanone (I) (melting point 121° , λ_{\max} 339 and 291 m μ ; computed for $C_{15}H_{10}O$: C 87.36 %, H 4.88 %, $M = 206$). This is the first unsaturated 3-membered ketone to be described. In spite of the considerable angular tension in the cycle (I) is a stable substance. It forms 2,4-dinitro phenyl-hydrazone (melting point $248-249^{\circ}$). In the hydration in alcohol over platinum black it absorbs 2 mol H_2 . Two intense absorption bands within the range of 1,600 and 1,850 cm^{-1} may be observed in the infrared spectrum.

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Diphenyl Cyclopropenone - Three-membered Analogue
of Tropone

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If HBr is introduced into the benzene solution of (I) bromide forms (in form of a monohydrate, melting point 148.5-149.0°; per cents computed for C₁₅H₁₃O₂Br: C 59.03, H 4.30, Br 26.19;

% found: C 58.87, H 4.37, Br 25.89) from which the initial ketone may be regenerated by the action with weak bases.

Similar salts form with HCl and HJ. The salt-forming properties of (I) as well as its anomalously high dipole moment 5.08 D (it was determined by Ya. K. Syrkin and A. N. Shidlovskaya) are due to the tendency of the cyclopropenone ring towards the formation of a stable aromatic system of cyclopropenyl (II). By the action of acids (I) is transformed into cation salts of diphenyl oxycyclopropenyl (III). Thus, cyclopropenone

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Diphenyl Cyclopropenone - Three-membered Analogue
of Tropone

SOV/62-59-3-34/37

derivatives are analogues of tropone which has the tendency to form the 7-membered aromatic system of tropyli. (I) was obtained by the action of dibromo carbene (from bromoform and tertiary potassium butylate) on diphenyl acetylene with subsequent hydrolysis. This reaction is the first case of an interaction between dihalogen carbenes and compounds containing a triple bond. The applicability of this reaction in the production of other cyclopropenones will be further investigated.

ASSOCIATION: Institut elementoorganicheskikh soedineniy Akademii nauk SSSR
(Institute of Elemental Organic Compounds of the Academy of Sciences, USSR)

SUBMITTED: January 9, 1959

Card 3/3

5(4)

AUTHORS:

Vol'pin, M. Ye., Zhdanova, K. I., SOV/62-59-4-37/42
Kursanov, D. N., Setkina, V. N., Shatenshteyn, A. I.

TITLE:

On the Interaction of Tropilium Salts With Electrophilic Reagents (O vzaimodoystvii soley tropiliya s elektrofil'nymi reagentami)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 4, pp 754-755 (USSR)

ABSTRACT:

This is a brief communication on the investigation of the deuterium exchange of tropilium salt in anhydrous D_2SO_4 .

It was found that at room temperature the tropilium ion does not take part in the reaction of the deuterium exchange even in the course of 168 hours. Thereafter the deuterium exchange was investigated under aggravated conditions, in liquid DBr in the presence of $AlBr_3$. It was found that tropilium bromide does practically not exchange the deuterium even under aggravated conditions, with $AlBr_3$ excess. (The exchange amounts to no more than 0.9 % in the course of 94 hours). The experiments showed a strong restraint of the electrophilic attack in tropilium salts. In this respect tropilium turned out to

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On the Interaction of Tropilium Salts With Electrophilic Reagents

SOV/62-59-4-37/42

be considerably more inactive than benzene and even unsaturated hydrocarbons. The cause of such a difficult course of the electrophilic substitution in the tropilium ion might be that all carbon atoms of the tropilium ring have a positive charge and the system has an electron deficit. This is in accordance with the general conception of the effect of the charge on the deuterium exchange (Ref 5). It can be expected that also other electrophilic reactions will be as little characteristic of the tropilium ion and as difficult as the deuterium exchange. There are 7 references, 4 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh sovedineniy Akademii nauk SSSR (Institute of Elemental-organic Compounds of the Academy of Sciences, USSR). Fiziko-khimicheskiy institut im. Karpova (Physico-chemical Institute imeni Karpov)

SUBMITTED: September 7, 1958

Card 2/2

SOV/79-29-2-70/71

AUTHORS: Belova, V. I., Vol'pin, M. Ye., Syrkin, Ya. K.

TITLE: Letter to the Editor (Pis'mo v redaktsiyu)
The Magnetic Receptivity of Tropyli Salts (Magnitnaya vospriimchivost' soley tropiliya)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol. 29, Nr 2, pp 693-694 (USSR)

ABSTRACT: The compound C_7H_7 is known to be stable in the cyclic structure form of the positively charged $C_7H_7^+$ ion. It is of interest to determine the diamagnetic receptivity of this ion and to compare it with the receptivity of other cyclic molecules, e.g. benzene and cyclooctatetraene. For this purpose the following compounds were synthesized and their receptivity was determined: tropyli hexachloro platinate $(C_7H_7)_2PtCl_6$, tropyli perchlorate $C_7H_7ClO_4$ and tropyli mercury tetraiodide $(C_7H_7)_2HgI_4$. A report on the synthesis of the first two compounds had already been made earlier (Ref 2). Tropyli mercury tetraiodide was first synthesized as follows: aqueous $HgCl_2$ -solution and

Card 1/3 KJ were added to C_7H_7Br solved in water (2.34 g, 3.72 g, and 9.1 g,

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Letter to the Editor. The Magnetic Receptivity of Tropyli Salts

respectively). $(C_7H_7)_2HgJ_4$ was separated and filtered, washed with 10 % KJ solution of water and alcohol and finally recrystallized from nitromethane. The magnetic receptivity was determined according to Saxsmith (Saksmit) at room temperature and with certain strength values of the magnetic field (Table 1). Unlike other platينات, the receptivity values of tropyli chloro platinate differ from one another in various syntheses. The table shows therefore the highest determination of receptivity, which surely corresponds to the purest sample (from the magnetic point of view). The value of magnetic receptivity in the organic cations of tropyli $C_7H_7^+$ was calculated from experimental data. The anion value of receptivity is given in the fourth column of the table. The receptivity value of ion $PtCl_6^{2-}$ was determined according to reference 3, that of the ion HgJ_4^{2-} according to reference 4. The value of ion ClO_4^- was obtained from table 3 (from the book by Selwood, P.W.) (Ref 5). The value of receptivity of ion $C_7H_7^+$, from various tropyli compounds, is recorded in the last column of the table. Pascal's additive scheme concerning the receptivity values of the compounds, containing conjugate bonds

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SOV/79-29-2-70/71

Letter to the Editor. The Magnetic Receptivity of Tropyli Salts

(C_6H_6 , $C_7H_7^+$, C_8H_8) is judged negatively by the authors and their own explanations are given.- There are 1 table and 6 references, 2 of which are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii i Institut elemento-organicheskikh soyedineniy Akademii nauk SSSR (Institute for General and Inorganic Chemistry and Institute for Elemental-organic Compounds of the Academy of Sciences, USSR)

SUBMITTED: July 20, 1958

Card 3/3

5(3)

SOV/79-29-9-10/76

AUTHORS:

Vol'pin, M. Ye, Akhrem, I. S., Kursanov, D. N.

TITLE:

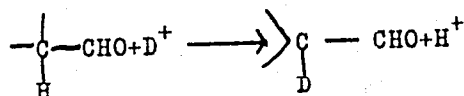
Reaction of Tropylium Salts With Aldehydes

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 9,
pp 2855 - 2857 (USSR)

ABSTRACT:

The present paper deals with the investigation of the reaction of tropylium salts with aldehydes, basing on the papers quoted by references 1,2. Owing to the mobility of α -hydrogen atoms of aldehydes, hydrogen is readily replaced by deuterium or bromine in the latter (Ref 3). Various condensations are made possible thereby:

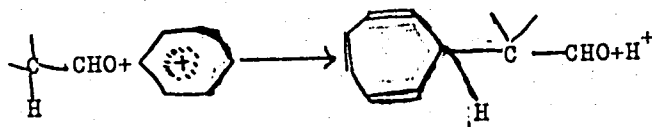


The authors found the cation of tropylium to react likewise with aldehydes. Already at room temperature (but more rapidly and in better yields at higher temperatures) one of the α -hydrogen atoms of aldehyde is replaced by the cycloheptatrienyl residue:

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Reaction of Tropylium Salts With Aldehydes

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This course is followed by the reaction of tropylium bromide with acetic, propionic, isobutyric acid aldehyde, which contain three, two or one α -hydrogen atom, respectively. Mono-substituted aldehydes (I), (II), (III) were obtained in all cases. Tropylium salts react likewise with isovaleraldehyde and other aldehydes, whereas benzaldehyde, which has no α -hydrogen atoms, does not enter reaction with the above salts even not with longer heating. The structure of cycloheptatrienyl acetic and α -cycloheptatrienyl isobutyric acid aldehyde was proven by the identity with aldehydes forming in the addition of tropylium salts on the corresponding vinyl ethers (Ref 4) (Scheme 3). The frequency, typical of the carbonyl group, in the infrared spectra of the aldehydes obtained shows that there is no conjugation of the C=O group with the C=C double bonds occurring in them. Thus, tropylium salts

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Reaction of Tropylium Salts With Aldehydes

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were shown to react (under no rigorous conditions) with aldehydes containing α -hydrogens, under the formation of a new C—C bond. There are 4 references, 3 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii Akademii nauk SSSR (Institute of Organic Chemistry of the Academy of Sciences, USSR)

SUBMITTED: August 22, 1958

Card 3/3

5(3)

SOV/20-126-4-25/62

AUTHORS: Vol'pin, M. Ye.; Kursanov, D. N., Corresponding Member AS USSR

TITLE: The Effect of Hydrogen Peroxide on Tropilium Salts (Deystviye perekisi vodoroda na soli tropiliya). A New Reaction Involving a Narrowing of a Seven-member Cycle (Novaya reaktsiya suzheniya semichlennogo tsikla)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 4, pp 780-783 (USSR)

ABSTRACT: Several examples are known of rearrangements of tropon and tropolon derivatives under the influence of cationic reagents (Ref 1). Benzene derivatives develop, containing the same number of carbon atoms as the original compound. Tropilium salts are subject to an analogous change. They are transformed into benzaldehyde under the influence of oxidizers (Refs 2, 3). The authors found out however, that the reciprocal action of tropilium salts and hydrogen peroxide involve a narrowing of the seven-member cycle, developing in another direction than described above. If equimolecular amounts of the two mentioned substances are mixed in a hydrous solution, a quick exothermal reaction develops. Its main products are: benzene, CO, formic acid and hydrogen bromide (Table 1). Furthermore small amounts of benzaldehyde and phenol develop.

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The Effect of Hydrogen Peroxide on Tropilium Salts. A New Reaction Involving
a Narrowing of a Seven-member Cycle

Thus the process on the whole takes place in two directions (see scheme). The authors studied the kinetics of the first two reactions (where CO develops). This reaction taking place with great velocity, follows an equation of second order. A greater increase in the acidity of the medium slows it down, but slightly. The apparent activation energy between 20 and 50° is much lower than in typically organic reactions. The mentioned reaction can hardly be called a radical one. From the results achieved one may draw the conclusion that in the first bimolecular phases of the reaction, a reciprocal action of the tropilium ion and H₂O₂ takes place, and an in-constant hydrogen peroxide develops (I). It is the tropilium ion which takes part in this reaction, and not its dissociated salt. It is possible, however, that (I) either decomposes with an immediate development of reaction products or that it first changes into a cation (II). The latter first splits into benzene and HCO⁺ cation. One could also believe that the reaction passes an intermediate state where tropon is produced. Tropon however, does not decompose into benzene and

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The Effect of Hydrogen Peroxide on Tropilium Salts. A New Reaction Involving a Narrowing of a Seven-member Cycle

CO. Neither is it possible that the reaction passes an intermediate state of benzaldehyde. Thus the reaction of the narrowing of the cycle studied here, differs from analogous reactions in so far, as it takes place under the synchronous splitting-up of two carbon linkages, at the same time developing a non-substituted benzene cycle. In this regard it is possible to compare it to the reactions of the 1,4-elimination of some bicyclic systems (Ref 5) (see scheme). There are 1 figure, 1 table, and 5 references, 2 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR
(Institute of Elemental Organic Compounds of the Academy of Sciences, USSR)

SUBMITTED: March 24, 1959

Card 3/3

~~5(2,7)~~ 5.3600

66171

SCV/20-128-5-24/67

AUTHORS: Vol'pin, M. Ye., Dulova, V. G., Kursanov, D. N., Corresponding
Member, AS USSR

TITLE: Formation of Tropilium in the Reaction of Monohalocarbenes
With Benzene

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 5,
pp 951 - 952 (USSR)

ABSTRACT: The reaction of hydrogen peroxide with tropilium salts causes
the elimination of one carbon atom and benzene formation as
was proved by the authors some time ago (Ref 1). An inverse
reaction, however, has so far not been known (extension of
the benzene cycle with the formation of a tropilium cation).
There exist only indirect data (Ref 2). The authors have proved
that small quantities of tropilium bromide are formed in all
cases if potassium tert-butyrate acts on CH_2Cl_2 , CH_2Br_2 or
 CH_2J_2 in a benzene medium and hydrogen bromide treatment follows.
This may be explained by intermediate formation of the mono-
halocarbenes CHX and their interaction with benzene (see Dia-
gram). The concentration of the initial substances and the

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SOV/20-128-5-24/67

Formation of Tropilium in the Reaction of Monohalocarbenes With Benzene

duration of reaction are of no importance for the yield. The tropilium yield increases slightly with temperature. The reaction investigated by the authors is the first case of formation of nonsubstituted monohalocarbenes observed. The rate of alcoholysis of haloid methylenes increases following the S_N2 mechanism according to the order $CH_2Cl_2 < CH_2Br_2 < CH_2J_2$ (Ref 4)

whereas the yield of the tropilium salt increases in inverse order (in agreement with reference 5). There are 6 references, 2 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR
(Institute of Elemental-organic Compounds of the Academy of Sciences, USSR)

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SUBMITTED: June 29, 1959

Card 2/2

5.3160

1960
501/60-00-1 1/1

AUTHORS: Kitaygorodskiy, A. I., Strochkov, Yu. T., Khodakovskiy, T. L., Vol'pin, M. Ye., Kurbanov, D. N.

TITLE: Crystal Structure of Tropylium Perchlorate and Iodide

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, Nr 1, pp 39-44 (USSR)

ABSTRACT: X-ray diffraction study of the structure of tropylium perchlorate and iodide monocrystals was made, using the method of three-dimensional electron density analysis. The following cell constants are given:

	$[C_7H_7][ClO_4]$	$[C_7H_7]I$
$a \approx b(\text{\AA})$	9.39 ± 0.04	9.01 ± 0.02
$c(\text{\AA})$	8.54 ± 0.04	8.22 ± 0.02
$V(\text{\AA}^3)$	652	678
$d_{measured} (g/cm^3)$	~ 1.4	~ 1.8
$d_{calculated} (g/cm^3)$	1.46	1.99
M	190.6	213.05
n	3	3

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Crystal Structure of Tropylium
Perchlorate and Iodide

78061

SOV/62-66-1-177

The radius of tropylium ring, length of C - C bond and other data are given in Figs. 1, 2, 3, 4, and 5. There are 5 figures; and 5 references, 1 U.K., 1 Danish, 3 Soviet. The U.K. reference is: M. G. S. Dewar, R. Pettit, J. Chem. Soc., 2011 (1956).

ASSOCIATION: Institute of Element-Organic Compounds Academy of Sciences USSR (Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR)

SUBMITTED: April 30, 1958

Card 2/5

Crystal Structure of Tropylium
Perchlorate and Iodide

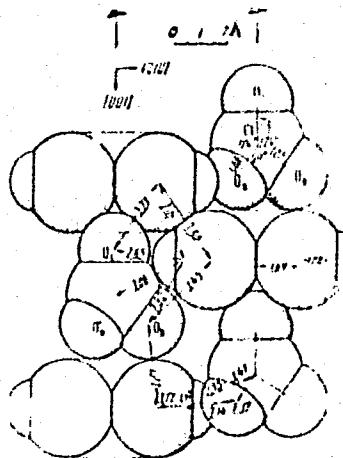


Fig. 1. Contacts anion-cation in tropylium perchlorate structure.

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SOV/62-60-1-7/37

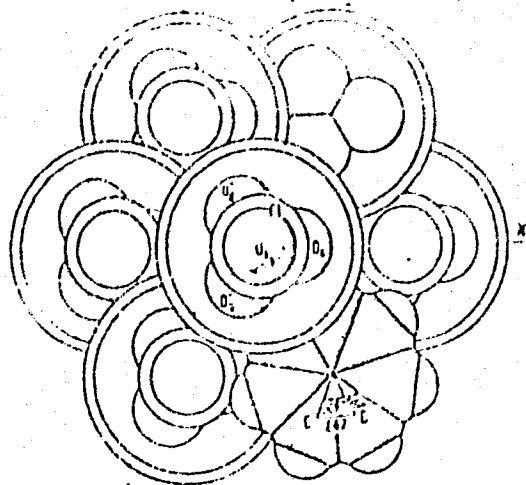


Fig. 2. Projection of xy structure of tropylium perchlorate.

Crystal Structure of Tropylium
Perchlorate and Iodide

78061
SOV/62-60-1-7/37

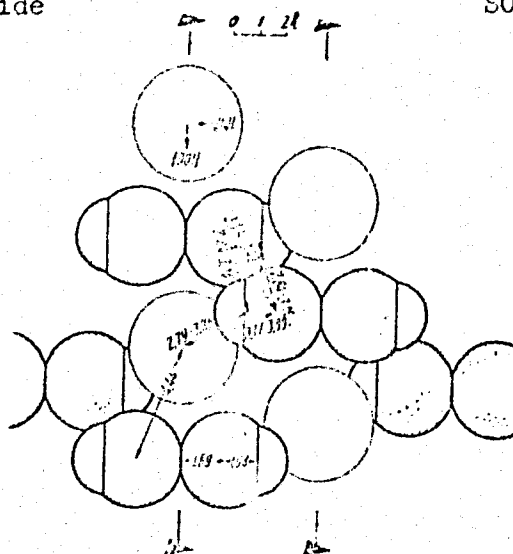


Fig. 3. Ions packing in structure of tropylium iodide.

C rd 4/5

Crystal Structure of Tropylium Perchlorate and Iodide

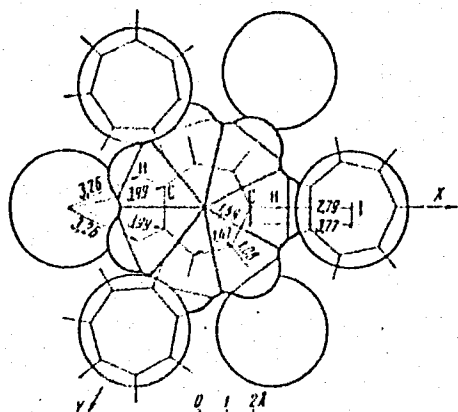


Fig. 4. Contacts cation-anion in structure of tropylium iodide.

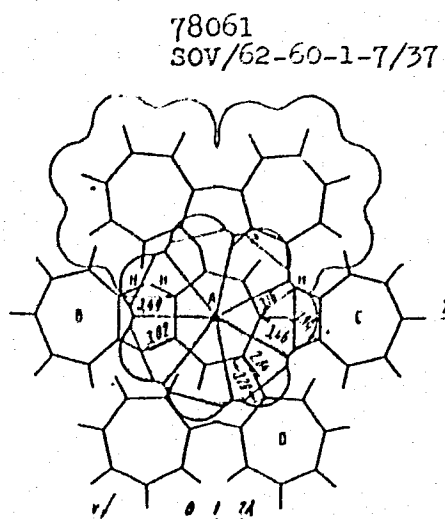


Fig. 5. Contacts cation-cation in structure of tropylium iodide.

Card 5/5

VOL'PIN, M.Ye.; PARNES, Z.N.; KURSANOV, D.N.

Hydride transfer in ditropyl ether, resulting in the formation of
tropone and tropyliene. Izv. AN SSSR Otd. khim. nauk no. 5:950
M, '60. (MIRA 13:6)

1. Institut elementoorganicheskikh soedineniy Akademii nauk
SSSR.
(Cycloheptatrienone) (Tropylum compounds) (Tropyliene)

84863

5.3700 2209,1308,1153

S/062/60/000/010/017/018
B015/B064AUTHORS: Vol'pin, M. Ye., and Kursanov, D. N.

TITLE: The Germanium Analog of Carbenes

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 10, p. 1903

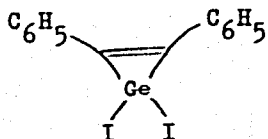
TEXT: In a previous paper (Ref.1), the authors jointly with Yu. D. Koreshkov investigated compounds of divalent carbon. Proceeding from the fact that an analogy exists between the electron structure of the derivatives of divalent germanium and divalent carbon, the authors studied the reaction between Ge^{2+} and substances with multiple carbon-carbon bonds, i.e., tolanes. By heating GeI_2 with tolane, a stable addition product, melting point at $300.5-303^\circ\text{C}$, was obtained, the gross formula is given as $\text{C}_{14}\text{H}_{10}\text{GeI}_2$. The most probable structural formula is

 1

Card 1/2

84863

The Germanium Analog of Carbenes

S/062/60/000/010/017/018
B015/B064

This substance is soluble in benzene, carbon tetrachloride, and alcohol, and insoluble in ether, heptane, and water. With silver nitrate in an alcoholic solution, silver iodide rapidly precipitates. Thus, it may be assumed that the addition of GeI₂ to the triple bond of tolane proceeds analogously to the addition of carbene dihalides. There is 1 Soviet reference. X

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental-organic Compounds of the Academy of Sciences USSR)

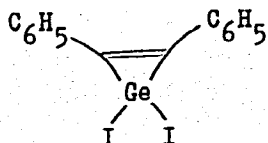
SUBMITTED: July 19, 1960

Card 2/2

84863

The Germanium Analog of Carbenes

S/062/60/000/010/017/018
B015/B064



This substance is soluble in benzene, carbon tetrachloride, and alcohol, and insoluble in ether, heptane, and water. With silver nitrate in an alcoholic solution, silver iodide rapidly precipitates. Thus, it may be assumed that the addition of GeI_2 to the triple bond of tolane proceeds analogously to the addition of carbene dihalides. There is 1 Soviet reference. ✓

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental-organic Compounds of the Academy of Sciences USSR)

SUBMITTED: July 19, 1960

Card 2/2

AUTHOR: Vol'pin, M.Ye. S/074/60/029/03/002/004
B008/B006

TITLE: Nonbenzenoid Aromatic Compounds and the Concept "Aromatic"

PERIODICAL: Uspekhi khimii, 1960, Vol 29, Nr 3, pp 298-363 (USSR)

ABSTRACT: The author gives a survey of the development of the chemistry of aromatic compounds. The characteristic properties and the structure of various nonbenzenoid, mainly carbocyclic, aromatic compounds are discussed here in greater detail. The term "aromatic" was coined nearly a hundred years ago, and was at first solely a description of quality without any physical meaning. Today, most of the numerous hypotheses on the structure of benzene and polynuclear aromatic compounds formed around the turn of the century are only of historic interest (Refs 4-19). The development of quantum-mechanical concepts of the nature of the chemical bond and the results obtained in the field of organic synthesis changed the ideas of the concept of aromatic compounds and their peculiarities, and considerably increased the number of systems which could be termed "aromatic". It was found that organic anions, organic cations, bipolar compounds, organo-metallic compounds, and several inorganic compounds, the composition and properties of which deviate completely from those of the traditional aromatic benzene derivatives, can be classed to the group of aromatic compounds. In this development, the method of

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Nonbenzenoid Aromatic Compounds and the
Concept "Aromatic"S/074/60/029/03/002/004
B006/B006

molecular orbits, first applied by Hückel (Refs 20,21), is of particular significance. Of the two chief calculation methods of quantum chemistry - the valence bond method and the method of molecular orbits - only the latter gives a correct picture of aromatic behavior. By this method it was possible to define the main criteria of the aromatic state. The author supplements and gives a more exact formulation of the definition of aromatic compounds by Dewar (Ref 331), which is repeatedly referred to lately: "Unsaturated cyclic compounds are aromatic, if all the atoms of the ring take part in the formation of a uniform conjugate system in which the π -electrons form a closed electron sheath". By the latter expression, one understands a π -electron system in which both the removal and the addition of electrons increase the total energy of the system and thus reduce its stability. Speaking in terms of the theory of molecular orbits this means that all the π -electrons are placed in bonding molecular orbits, two electrons being in each of them. The formation of a closed electron sheath is the cause of the physical and chemical properties characteristic of all aromatic systems: high stability, comparatively easy formation, the occurrence of substitution rather than addition to multiple bonds, bond lengths intermediate between single and double bonds, a planar or practically planar molecule,

Card 2/4

Nonbenzenoid Aromatic Compounds and the
Concept "Aromatic"S/074/60/029/03/002/004
B008/B006

equality of carbon-carbon bonds in unsubstituted monocyclic carbon rings. Great success in the field of synthesis and investigation of nonbenzenoid aromatic systems was achieved in the last decade. In this new field of organic chemistry a close contact between quantum-mechanical and synthetic methods is observable, which rendered it possible to predict a series of novel aromatic systems. In the present paper the author discusses the following aromatic compounds: the cyclopentadienide anion (the suffix "ide" is widely used to designate organic anions at present) (Refs 22, 40-88), tropylium cation (Refs 26, 89-140), cyclopropenyl cation (Refs 22, 141-145), azulenes (Refs 146-174), cyclobutadiene (Refs 175-222), cyclooctatetraene⁷ (Refs 25, 27, 223-231), pentalene and heptalene (Refs 19, 25, 232-263), polycyclic systems (Refs 23, 264-275), macrocyclic aromatic systems - table p 344 - (Refs 238, 276 - 288), aromatic metal complex compounds⁷ (Refs 289-301), aromatic heterocyclic compounds (Refs 2, 20, 73, 268, 302-307), inorganic aromatic compounds (Refs 308-330). The concept of the specific stability of the 6-electron system was successfully applied by Syrkin (Ref 332) to interpret a large number of organic reactions. In the next years, a rapid development of the chemistry of aromatic nonbenzenoid compounds is to be expected, especially the synthesis of new aromatic macrocyclic compounds, the cyclopropenyl

Card 3/4

Nonbenzenoid Aromatic Compounds and the
Concept "Aromatic"

S/074/60/029/03/002/004
B008/B006

cation as well as of new heterocyclic, polycyclic, and inorganic systems. The application of aromatic nonbenzenoid compounds opens up new ways of obtaining various substances with hitherto unattainable properties. The following persons are mentioned: D.N. Kursanov, Z.N. Parnes, N.K. Baranetskaya, V.N. Setkina, A.A. Balandin, M.L. Khidekel', V.G. Dulova, A.I. Kitaygorodskiy, I.S. Akhrem, D.A. Bochvar, I.V. Stankevich, A.L. Chistyakov, Yu.D. Koreshev, A.Ye. Favorskiy, T.A. Favorskaya, I.L. Knunyants, B.L. Dyatkin, N.P. Gambaryan, M.Ye. Dyatkina, Ye.M. Shustorovich, Yu.A. Zhdanov, A.N. Nesmeyanov, E.G. Perevalova, Ya.K. Syrkin, and the author of the present paper, A.M. Butlerov, Shidlovskaya. There are 1 table and 333 references, 49 of which are Soviet.

ASSOCIATION: In-t elementoorganicheskikh soyedineniy AN SSSR (Institute of
Elemental-organic Compounds of the AS USSR)

Card 4/4

S/079/60/030/04/28/080
B001/B016AUTHORS: Vol'pin, M. Ye., Akhrem, I. S., Kursanov, D. N.TITLE: Reaction of Tropylium Salts With Compounds Having a
Mobile Hydrogen

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 4, pp. 1187-1190

TEXT: In continuation of their previous papers (Refs. 1, 2), the authors investigated in the present paper the reaction of tropylium bromide with derivatives of carboxylic acids and with ketones. The aliphatic mono-carboxylic acids (acetic, propionic, and butyric acid) and their esters (methyl-, ethyl acetate, ethyl propionate) were found not to react with tropylium salts even on prolonged heating. It is different with compounds in which the mobility of the α -hydrogen atoms is increased by introducing activating substituents. Malonic acid, acetoacetic ester, cyanoacetic ester, and nitro-acetic ester react immediately with the above salts, already at room temperature. In all cases, the corresponding substitution products are obtained, with the cycloheptatrienyl radical being substituted for one hydrogen atom (Scheme 1). Ketones with a

Card 1/3

Reaction of Tropylium Salts With Compounds Having a Mobile Hydrogen

S/079/60/030/04/28/080
B001/B016

carbonyl group without activating substituents (acetone, acetophenone) enter into reaction with tropylium under far more rigorous conditions. On prolonged heating of the ketones with tropylium bromide, the substitution of the α -hydrogen atom takes place under formation of a monosubstituted product (Scheme 2). The introduction of a second carbonyl group considerably activates the molecule. Thus, acetyl acetone reacts immediately with tropylium salts, already in the cold. When treating tropylium bromide dissolved in water, the dicycloheptatrienyl ester is known to be formed (Ref. 3). The C-O bond in this compound, contrary to the common ethers, is very unstable, and readily breaks when treated with mineral acids to give tropylium salts: ✓

$(C_7H_7)_2O + 2HBr \longrightarrow 2C_7H_7^+Br^- + H_2O$. The ditropylium ether was found to react with acetoacetic ester on heating under formation of the same product as in the reaction of tropylium bromide with acetoacetic ester (Scheme 3). The tropylation reaction may generally be applied to the synthesis of different cycloheptatrienyl derivatives. There are 3 references, 2 of which are Soviet.

Card 2/3

Reaction of Tropylium Salts With Com-
pounds Having a Mobile Hydrogen

B/079/60/030/04/28/080
B001/B016

ASSOCIATION: Moskovskiy institut elementoorganicheskikh soyedineniy
(Moscow Institute of Elemental-organic Compounds)

SUBMITTED: April 27, 1959

Card 3/3

KURSANOV, D.N.; VOL'PIN, M.Ye.; KORESHKOV, Yu.D.

Interaction of dihalo carbenes with tolan. Synthesis of diphenylcyclopropenone and of diphenylhydroxycyclopropenyl salts. Zhur. ob. khim. 30 no.9:2877-2884 S '60. (MIRA 13:9)

1. Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR. (Cyclopropenone)

VOL'PIN, M.Ye.; KORESHKOV, Yu.D.; KURSANOV, D.N.

Silicon analog of carbenes and the synthesis of a silicon-containing three-membered heterocycle. Izv. AN SSSR. Otd. khim.nauk no.7:1355-1356 J1 '61. (MIRA 14:7)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Silicon organic compounds)

ZAYTSEV, B. Ye.; KORESHKOV, Yu.D.; VOL'PIN, M.Ye.; SHEYNKER, Yu.N.

Structure of diphenylcyclopropenone and tropone salts. Dokl.
AN SSSR 139 no.5:1107-1109 Ag. '61. (MIRA 14:8)

1. Institut khimii prirodnkh soyedineniy AN SSSR i Institut
elementoorganicheskikh soyedineniy AN SSSR. Predstavleno
akademikom M.M. Shemyakinym.
(Propenone) (Cycloheptatrienone)

KURSANOV, D.N.; VOL'PIN, M.Ye., doktor khimicheskikh nauk

New nonbenzenoid aromatic systems and the problem of aromaticity.
Zhur. VKHO 7 no.3:282-290 '62. (MIRA 15:6)

1. Chlen-korrespondent Akademii nauk SSSR (for Kursanov).
(Aromatic compounds)

VOL'PIN, M.Ye.; KURSANOV, D.N.

Three-membered aromatic heterocycles. Part 1: Theoretical premises.
Zhur.ob.khim. 32 no.4:1137-1141 Ap '62. (MIRA 15:4)

1. Institut elementoorganicheskikh soyedineniy.
(Heterocyclic compounds)

VOL'PIN, M.Ye.; KURSAKOV, D.N.

Three-membered aromatic heterocycles. Part 2: Preparation. Carbenes and carbenoids. Zhur.ob.khim. 32 no.4:1142-1146 Ap '62.
(MIRA 15:4)

1. Institut elementoorganicheskikh soyedineniy.
(Carbenes) (Heterocyclic compounds)

VOL'PIN, M.Ye.; KURSANOV, D.N.

Three-membered aromatic heterocycles. Part 3: Reaction of a germanium analog of carbenes with tolan. Synthesis of a germanium-containing three-membered ring. Zhur.ob.khim. 32 no.5:1455-1460 My '62. (MIRA 15:5)

1. Institut elementoorganicheskikh soedineniy AN SSSR.
(Germanium organic compounds) (Heterocyclic compounds)

VOL'PIN, M.Ye.; SHUR, V.B.

Nitrogen fixation on complex catalysts. Dokl. AN SSSR 156
1102-1104 Je '64. (MIRA 17:6)

1. Institut elementoorganicheskikh soedineniy AN SSSR.
Predstavleno akademikom A.N.Nesmeyanovym.

L 05166-67 ENI(m)/ENP(j) RM
ACC NR: AP7000734

SOURCE CODE: UR/0062/66/000/006/1083/1084

VOL'PIN, M. Ye., CHAPOVSKAYA, N. K., SHUR, V. B., Institute of Heteroorganic
Compounds, Academy of Sciences USSR (Institut elementoorganicheskikh soedineniy
AN SSSR)

"Reaction of Nitrogen with Systems Based on Phosphine Complexes of Transition
Metals" 34
B

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 6, 1966,
pp 1083-1084

Abstract: The reaction of nitrogen with systems produced by the reaction of a
number of phosphine complexes of transition metals $[(\text{Ph}_3\text{P})_2\text{TiCl}_4, (\text{Ph}_3\text{P})_2\text{FeCl}_3,$
 $(\text{Ph}_3\text{P})_2\text{CoCl}_2, (\text{Ph}_3\text{P})_2\text{NiCl}_2, (\text{Ph}_3\text{P})_2\text{PdCl}_2,$ and $(\text{Ph}_3\text{P})_2\text{PtCl}_2]$ with organometallic
compounds $[\text{C}_2\text{H}_5\text{MgBr}$ in ether, $n\text{-C}_4\text{H}_9\text{Li}$ in n-heptane, and $(i\text{-C}_4\text{H}_9)_3\text{Al}$ in n-heptane].
was studied. Systems including triphenylphosphine complexes of Ti (IV) and Fe
(III) react with molecular nitrogen at room temperature. The other systems
studied, as well as systems of the triphenylphosphine complexes with LiAlH_4 (in
ether) and NaBH_4 (in water and alcohol) were essentially inactive in the reac-
tion with nitrogen. The pattern observed was the same as for chlorides and
acetylacetonates: the most active are compounds of the transition metals situ-
ated in the left-hand portion of the transition period. [JPRS: 37,023]
TOPIC TAGS: organometallic compound, organic phosphorus compound, lithium aluminum
hydride

SUB CODE: 07 / SUBM DATE: 05Nov65 / ORIG REF: 004 / OTH REF: 006
Card 1/1 vmb UDC: 541.49 + 546.17 + 661.728.1

ACC NR: AP7011354

SOURCE CODE: UR/0062/66/000/011/2041/2042

AUTHOR: Vol'pin, M. Ye.; Kolomnikov, I. S.

ORG: Institute of Heteroorganic Compounds, Academy of Sciences USSR
(Institut elementoorganicheskikh soyedineniy AN SSSR)

TITLE: Complex of zero-valent cobalt with triethylphosphite

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 11, 1966, 2041-2042

TOPIC TAGS: cobalt compound, phosphate ester, electron paramagnetic resonance

SUB CODE: 07

ABSTRACT: In an earlier report, the production of phosphite complexes of univalent cobalt L_4CoCl and L_3CoCl , where $L = (C_2H_5O)_3P$, was announced. Under homogeneous conditions, these complexes were found to absorb molecular hydrogen, yielding a complex of zero-valent cobalt, with the composition L_4Co -- the first representative of complexes of zero-valent cobalt with phosphorus ligands. This complex was found to be a white crystalline substance, stable in air for several hours. Electron paramagnetic resonance studies indicated that the complex exists in dimer form. The absence of a Co-H bond was demonstrated by a study of the infrared spectrum and by reactions with iodine and carbon tetrachloride. The authors thank V. I. Belovaya, Card 1/2

UDC: 541.49:661.718.1:546.73

093/1739

ACC NR: AP7011354

of the Institute of Inorganic Chemistry, AN SSSR, for measuring the magnetic susceptibility, and V. I. Sheychenko, of the Institute of Natural Compounds, AN SSSR, for taking the spectrums of the YaMR. Orig. art. has: 1 formula.
[JPRS: 40,351]

Card 2/2

YOL'PIN, M.Ye.; ILATOVSKAYA, M.A.; LARIKOV, Ye.I.; KHADEKEL', M.L.;
SHVETSOV, Yu.A.; SHUR, V.B.

Nitrogen fixation on hydrogen-activating transition metal
complexes. Dokl. AN SSSR 164 no.2:331-333 S '65.

(MIRA 18:9)

1. Institut elementoorganicheskikh soedineniy AN SSSR i
Institut khimicheskoy fiziki AN SSSR. Submitted February
15, 1965.

VOL'PIN, M.Ye.; SHUR, V.B.; BICHIN, L.P.

Study of nitrogen fixation on complex catalysts by means of N^{15} .
Izv. AN SSSR. Ser. khim. no.4:720-721 '65. (MIRA 18:5)

1. Institut elementoorganicheskikh soedineniy AN SSSR i Institut biologicheskoy i meditsinskoy khimii AMN SSSR.

VOL'PIN, M.Ye.; AKHREM, I.S.

Light heterolytic rupture of the carbon-carbon bond in cycloheptatriene derivatives. Dokl. AN SSSR 161 no.3:597-600 Mr '65.
(JIRA 18:4)

1. Institut elementoorganicheskikh soyedineniy AN SSSR. Submitted September 12, 1964.

VOL'FIN, M.Ye.; SHUR, V.B.; ILATOVSKAYA, M.A.

Fixation of nitrogen by the system based on dicyclopentadienyl-
titanium dichloride. *zv.AN SSSR.Ser.khim.* no.9:1728-1729 S '64.
(MIRA 17:10)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

TERENT'YEV, Aleksandr Petrovich; POTAPOV, Viktor Mikhaylovich;
KOLOSOV, M.N., st. nauchn. sotr., retsenzent; VOL'PIN,
M.Ye., doktor khim. nauk, red.

[Principles of stereochemistry] Osnovy stereokhimii. Mo-
skva, Khimiia, 1964. 687 p. (MIRA 17:12)

VOL'PIN, M.Ye.; STRUCHKOV, Yu.T.; VILKOV, L.V.; MASTRYUKOV, V.S.;
DULOVA, V.G.; KURSANOV, D.N.

Structure of the products obtained in the reaction of acetylene
with bivalent derivatives of germanium. Izv. AN SSSR. Ser.
khim. no.11:2067 N '63. (MIRA 17:1)

1. Institut elementoorganicheskikh soedineniy AN SSSR.

VOL'PIN, M.Ye.; DUBOVITSKIY, V.A.; NOGINA, O.V.; KURSANOV, D.N.

Titanocene compound with tolan. Dokl. AN SSSR 151 no.5:1100-1103
Ag '63. (MIRA 16:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
2. Chlen-korrespondent AN SSSR (for Kursanov).
(Titanium) (Acetylene)

LEYTES, L.A.; DULOVA, V.G.; VOL'PIN, M.Ye.

Three-membered aromatic heterocycles. Report No.5: Vibrational spectra and structure of germanium heterocycles. Izv. AN SSSR. Otd.khim. nauk no.4:731-737 Ap '63. (MIRA 16:3)

1. Institut elementoorganicheskikh soyedineniy AN SSSR i Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Germanium organic compounds—Spectra) (Heterocyclic compounds)

VOL'PIN, M.Ye.; DULOVA, V.G.; KURSANOV, D.N.

- ~~Three-membered aromatic heterocycles.~~ Report No.4: Reaction of germanium diiodide with acetylene and the ~~synthesis of a three-membered heterocycle and germanium-containing polymer.~~ Izv. AN SSSR. Otd.khim. nauk no.4: 27-731 Ap '63. (MIRA 16:3)

1. Institut elementoorganicheskikh soedineniy AN SSSR.
(Germanium organic compounds) (Heterocyclic compounds)

EYDUS, Ya.T.; NEFEDOV, B.K.; VOL'PIN, M.Ye.

Formation of cycloheptatriene from benzene, carbon monoxide,
and hydrogen on cobalt catalysts. Izv. AN SSSR, Otd. khim. nauk
no. 3: 548-552 Mr '63. (MIRA 16:4)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR i
Institut elementoorganicheskikh soyedineniy AN SSSR.
(Cycloheptatriene)

VOL'PIN, A. S.

"Concerning the Weight of Bicomacts." Thesis for degree of Cand. Physicomathematical Sci. Sub. 1 Jun 49, Sci Res Inst of Mathematics, Moscow Order of Lenin State U izeni M. V. Lomonosov.

Summary 82, 18 Dec 52, Dissertations Presented For Degrees in Science and Engineering in Moscow in 1949. From Vechernaya Moskva. Jan-Dec 1949.

VOL'PIN, A.S.

CAND PHYSICOMATH SCI.

Dissertation: "Concerning the Weight of Bicomacts."

1 June 49

Sci Res Inst of Mathematics, Moscow Order of Lenin State V imeni M.V. Lomonosov.

SO Vecheryaya Moskva
Sum 71

VOL'PIN, E.I.

Sanitariia i gigiena v miasnoi i molochnoi promyshlennosti [Sanitation and hygiene in the meat and milk industry]. Moskva, Fishchepromizdat, 1953. 121 p.

SO: Monthly List of Russian Accessions, Vol. 6, No. 2, May 1953